What is claimed is:

1. A detection-grid beneath, within, or on the thermal protection surface of a vehicle, such as a shuttle, whose electrical characteristics are changed when the detection-grid is exposed to mechanical traumas that may impair the operational characteristics of the vehicle.

2. The circuit that translates the electrical characteristics of the detection-grid that reflect mechanical trauma of a vehicle's surface into meaningful digital values down-loadable from the vehicle to a support station on the ground via telemetry, as well as for display to the vehicle's crew.

3. The redundant inclusion of specific pressure sensors within cavities of a thermally-protective surface of a vehicle in conjunction with the apparatus of claim 1.

4. The inclusion of telemetry from pressure sensors of claim 3 with the telemetry in claim 2 that supports rapid decisions to abort or continue a vehicle's operation.

5. The firmware and software within the circuit of claim 2 that produces meaningful conversion of grid electrical characteristics into meaningful digital values for down-load or display to the crew.